may be defined to be in front of a video display associated with the computer. The processor may be operable to map the absolute position of the object of interest to the position indicator such that the location of the position indicator on the video display is aligned with the object of interest.

[0029] The region of interest may be defined to be any distance in front of a video display associated with the computer, and the processor may be operable to map the absolute position of the object of interest to the position indicator such that the location of the position indicator on the video display is aligned to a position pointed to by the object of interest. Alternatively, the region of interest may be defined to be any distance in front of a video display associated with the computer, and the processor may be operable to map the absolute position of the object of interest to the position indicator such that movements of the object of interest are scaled to larger movements of the location of the position indicator on the video display.

[0030] The processor may be configured to emulate a computer mouse function. This may include configuring the processor to emulate controlling buttons of a computer mouse using gestures derived from the motion of the object of interest. A sustained position of the object of interest for a predetermined time period may trigger a selection action within the application program.

[0031] The processor may be configured to emulate controlling buttons of a computer mouse based on a sustained position of the object of interest for a predetermined time period. Sustaining a position of the object of interest within the bounds of an interactive display region for a predetermined time period may trigger a selection action within the application program.

[0032] The processor may be configured to emulate controlling buttons of a computer mouse based on a sustained position of the position indicator within the bounds of an interactive display region for a predetermined time period.

[0033] In the above aspects, the background data set may include data points representing at least a portion of a stationary structure. In this implementation, at least a portion of the stationary structure may include a patterned surface that is visible to the video cameras. The stationary structure may be a window frame. Alternatively, the stationary structure may include a strip of light.

[0034] In another aspect, a multiple camera tracking system for interfacing with an application program running on a computer is disclosed. The system includes two or more video cameras arranged to provide different viewpoints of a region of interest and are operable to produce a series of video images. A processor is operable to receive the series of video images and detect objects appearing in the region of interest. The processor executes a process to generate a background data set from the video images, generate an image data set for each received video image, compare each image data set to the background data set to produce a difference map for each image data set, detect a relative position of an object of interest within each difference map, produce an absolute position of the object of interest from the relative positions of the object of interest, define sub regions within the region of interest, identify a sub region occupied by the object of interest, associate an action with the identified sub region that is activated when the object of interest occupies the identified sub region, and apply the action to interface with the application program.

[0035] In the above implementation, the object of interest may be a human hand. Additionally, the action associated with the identified sub region may emulate the activation of keys of a keyboard associated with the application program. In a related implementation, sustaining a position of the object of interest in any sub region for a predetermined time period may trigger the action.

[0036] The details of one or more implementations are set forth in the accompanying drawings and the description below. Other features and advantages will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0037] **FIG. 1** shows the hardware components of a typical implementation of the multicamera control system, and their typical physical layout.

[0038] **FIG. 2A** shows the typical geometric relationship between the cameras and various image regions of **FIG. 1**.

[0039] **FIG. 2B** shows a typical image captured by one of the cameras of **FIG. 1**.

[0040] **FIG. 3** is a flow diagram showing the processes that are performed, typically within a microcomputer program associated with the multicamera control system.

[0041] **FIG. 4** is a flow diagram showing a portion of the process shown in **FIG. 3** in greater detail, and in particular, the processes involved in detecting an object and extracting its position from the image signals captured by the cameras.

[0042] **FIG. 5A** shows sample image data, presented as a gray-scale bitmap image, acquired by a camera and generated by part of the process shown in **FIG. 4**.

[0043] **FIG. 5B** shows sample image data, presented as a gray-scale bitmap image, generated by part of the process shown in **FIG. 4**.

[0044] **FIG. 5C** shows sample image data, presented as a gray-scale bitmap image, generated by part of the process shown in **FIG. 4**.

[0045] **FIG. 5D** shows sample image data, presented as a gray-scale bitmap image, generated by part of the process shown in **FIG. 4**.

[0046] **FIG. 5E** shows sample data, presented as a binary bitmap image, identifying those pixels that likely belong to the object that is being tracked in the sample, generated by part of the process shown in **FIG. 4**.

[0047] **FIG. 6** is a flow diagram showing a portion of the process described in **FIG. 4** in greater detail, and in particular, the processes involved in classifying and identifying the object given a map of pixels that have been identified as likely to belong to the object that is being tracked, for example given the data shown in **FIG. 5E**.

[0048] **FIG. 7A** shows the sample data presented in **FIG. 5E**, presented as a binary bitmap image, with the identification of those data samples that the processes shown in **FIG. 6** have selected as belonging to the object in this sample.